

## **CSCAPE 2005: NOAA Ship *David Starr Jordan***

### **Weekly Science Report – Leg 4**

15 September 2005

Eric Archer – Cruise Leader

### **SCIENCE SUMMARY: 09 September – 14 September 2005**

After a lovely inport in Eureka, CSCAPE got underway Monday afternoon of this week. We're happy to welcome aboard returning observer, Tim O'Toole; birder, Dawn Breese; visiting scientist, Gaby Serra-Valente; and independent observers Jamie Hall and Shawn Noren.

Before I get to the at-sea fun, a big thanks and round of applause goes out to Gary and Jan Friedrichsen for hosting a spectacular party at their lovely house on Saturday. Scientists and crew were treated to some very tasty fresh-caught albacore from the previous leg, marinated chicken, some of Gary's world-famous Caesar salad, and a host of other goodies too numerous to mention. Just to make sure you're fully and completely sorry you missed it; dessert was homemade cobbler with blackberries fresh-picked from Gary's backyard. Mmmm, yummy.

As we started effort heading westbound along our trackline, we quickly encountered some harbor porpoise, but finished the day with a nice sunset blue whale sighting. We were greeted the following day by Dall's porpoise which continued to pop up and zip by throughout the day. Wednesday turned out to be a big sperm whale day with three sightings in all. The first sighting was particularly notable as mixed in with the sperm whales was an unexpected group of bottlenose dolphins. I really shouldn't say "unexpected" however, because a quick review of past sightings and biopsies showed that the northernmost record from our cruises is a solitary point in pretty much the very same area. Given that they're definitely rare from this far north, we tried to make some passes with the *Jordan* for biopsies and photos. They were definitely standoffish at first, and after a few passes tentatively approached the bow, but none were brave enough to take one for the team and ride. However, our photographers got quite a few good shots as you'll read about below, so all was not lost.

As the week closes, we are making a brief run north before we head west again to the outer boundary of our study area. Weather has been quite good with largely Beaufort 3-4 conditions and good visibility. Immediate forecasts are for more of the same, so it's just up to the animals to show up for the party.

### **Sightings and Effort Summary for Marine Mammals**

<b>Date</b>	<b>Start Stop</b>	<b>Position</b>	<b>Total Distance</b>	<b>Avg. Beaufort</b>
091205	1709	N40:27.37 W124:27.64	16.0 nmi	2.3
	1905	N40:31.91 W124:49.21		
091305	0702	N40:32.06 W124:50.87	106.3 nmi	3.4
	1938	N40:59.44 W127:08.67		
091405	0709	N40:58.93 W127:04.44	85.1 nmi	3.9
	1912	N41:37.79 W127:22.62		

CODE	SPECIES	Weekly Total	CSCAPE Total
5	Unid. common dolphin		1
13	Striped dolphin		4
17	Short-beaked common dolphin		34
18	Bottlenose dolphin	1	5
21	Risso's dolphin		52
22	Pacific white-sided dolphin		88
27	Northern right whale dolphin		26
37	Killer whale		9
40	Harbor porpoise	1	77
44	Dall's porpoise	6	149
46	Sperm whale	3	23
49	Ziphiid whale		2
51	Mesoplodon sp.		4
61	Cuvier's beaked whale		3
63	Baird's beaked whale		3
69	Gray whale		2
70	Balaenoptera sp.		25
71	Minke whale		7
74	Fin whale		60
75	Blue whale	1	43
76	Humpback whale		364
77	Unid. dolphin		39
277	Unid. medium delphinid		1
78	Unid. small whale		3
79	Unid. large whale		39
96	Unid. Cetacean		3
	<b>TOTAL</b>	<b>12</b>	<b>1066</b>

Note: Pinnipeds not included; mixed groups are counted once for each species.

### **Photo-Project** (Annie Douglas, Cornelia Oedekoven and Holly Fearnbach)

After a relaxing weekend taking photographs of giant red wood trees and wild elk, we are back onboard ready to find marine mammals. The only blue whales sighted this week were found only about 15nm off of California's lost coast, however darkness has begun to fall early out here, and even with the camera set at 1600 ISO we still can't make out the pigmentation patterns on the animals. We had much better luck with a group of bottlenose dolphins that were loosely associated with a large group of sperm whales 126 nautical miles offshore. We made a special detour to take photographs of these dolphins, because this species is not commonly seen north of San Francisco (on the 2001 ORCAWALE cruise bottlenose dolphins were not seen farther north than the Santa Barbara Channel). Although recognized as a single genus there is significant physical variation, including physical differences between offshore and inshore bottlenose of the eastern Pacific. Along with observations from observers, the photographs should help map out physical appearance of bottlenose dolphins sighted offshore of northern California. Dolphins in this sighting appeared to have fairly dark capes and more mottling than we generally see on

bottlenose dolphins farther south. About 70% of the school had extensive tooth rake marks on their backs and dorsal fins as well as round oval scars. Some of these observations concur with the available literature, which states that offshore bottlenose dolphins are expected to be darker and smaller than nearshore animals. The observed rake marks were likely a result of intraspecific interaction, and the oval scars could be caused by an ectoparasite.



Photo by Cornelia Oedekoven

*Tursiops truncatus*, offshore

Species	Weekly	CSCAPE Total
Humpback whale IDs	-	86
Blue whale IDs	*	33
Fin whale IDs	-	28
Sperm whale IDs	1	19
Killer whale IDs	-	61
Baird's beaked whales*	-	2
Short-beaked common dolphins*	-	13
Bottlenose dolphins*	1	1
Northern right whale dolphins*	-	7
Pacific white-sided dolphins*	-	13
Risso's dolphins*	-	10
Dall's porpoise*	-	2
Striped and short-beaked common dolphins**	-	4

\* two animals photographed, too dark for identification

\*\*number of groups photographed

### **Bird Buzz** (Dawn Breese and Thomas Staudt)

We left Eureka Harbor and headed south along the rugged coastline to our official destination and starting point, Cape Mendocino. We were graced by the presence of a Laysan Albatross about an hour out of Eureka! For these first three days, we've regularly seen their relatives, the Black-footed Albatross and Sooty Shearwater. We have seen flocks of hundreds of Arctic Terns feeding over albacore (we fed on a couple as well), and flocks of Leach's Storm-Petrels. There are periods between sightings with one or two individual birds, then a few hundred concentrated

in flocks feeding or, interestingly for the terns, sitting on the water (I've not seen terns rest on the water for long periods before, though they do take advantage of floating kelp and stray fishing floats). We're in an area where the common Jaeger is the Long-tailed, but we've seen all three species (Parasitic and one Pomarine). Jaegers are graceful, adept flyers with long central tail feathers. They are "kleptoparasites;" they feed by pestering other birds and harassing them to the point where they cough up their hard-earned fish. It is fun to watch, but not for the terns. As we head west, we leave the Rhinoceros Auklets and Common Murres behind, but continue to see occasional Cassin's Auklets and Xantus's Murrelets. Total species for our first three days was 25, including a Yellow Warbler, a probable Palm Warbler, and a flock of migrating Northern Pintail. In Eureka, we said goodbye to Scott Mills and welcomed to Dawn Breese for this Leg. The weather's fine, the crew is gracious and professional, and life at sea is a pleasure!

### Oceanographic Operations (Candice Hall & Liz Zele)

This week's report will be short and sweet, just as our week has been! Escorted by harbor porpoise, we left the chilly (to these foreign bones!) Eureka waters of 11°C (52°F) and jumped into warm 17°C (63°F) waters within a few hours. To us out here, this seemed to indicate an intense coastal upwelling zone, as depicted in figure 1 below. This figure shows the variability of the California Current System as modeled by the Regional Oceanic Modeling System (ROMS) model.

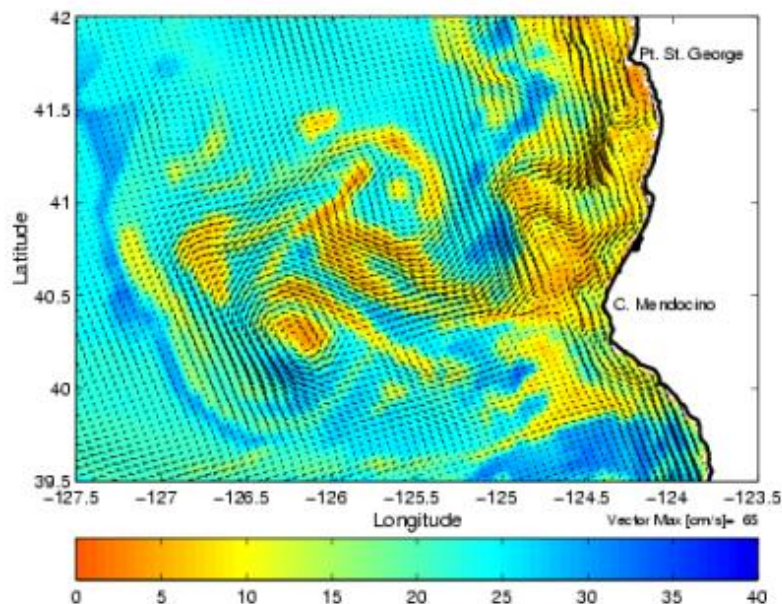


Figure 1: Upwelling filament in surface boundary-layer depth and currents off Cape Mendocino in late summer from the ROMS model with 3.5 km resolution (Marchesiello *et. al.*, Equilibrium Structure and Dynamics of the California Current System, 2001).

We have stayed in these warmer 17°C waters, apart from the occasional foray into 18°C (65°F). Reflecting these water temperatures have been yesterday's sighting of what we believe to be a Striped marlin (*Tetrapturus audax*), apparently normally found in higher latitude waters (see figure 2). Today the first skipjack tuna (*Katsuwonus pelamis*) of the cruise was caught.



Figure 2: Striped marlin (*Tetrapturus audax*) as seen on the 14 September 2005 during the CSCAPE cruise (Photo: Cornelia Oedekoven).

On the CO<sub>2</sub> front, our graph has predictably shown higher CO<sub>2</sub> levels near the coast, dropping off as we have moved offshore. As before the hydrographic CO<sub>2</sub> levels have stabilized at approximately 370  $\mu$ moles/mole.

Our quote for the week: ‘In order to travel to distant lands, you must first lose sight of the shore’ (Unknown, from the recesses of Liz’ mind).

Date	CTD's	Bongo tows	XBT's	Comments
09/08	1	4	0	Bongo too shallow
09/09	0	0	0	Eureka inport
09/10	0	0	0	Eureka inport
09/11	0	0	0	Eureka inport
09/12	0	1	0	Departed from Eureka @ 1300
09/13	2	1	4	
09/14	1	1	4	

### **Squeakly Report (Liz Zele)**

I have not a squeak to report. Cross your fingers that next week is more acoustically productive!